Space Weather Forecast

Issued on Friday 24 January 2025 at 12:19 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate geomagnetic storm (G2) period this UTC weekend.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity was at Low levels, with declining magnitude occasional Common-class activity, peaking at 23/1636UTC from a large and complex sunspot region in the southwest.

There are currently eight sunspot regions on the Earth-facing side of the Sun, with a ninth region now faded. The largest, most active and nominally most complex region remains in the southwestern quadrant. This group has shown a spreading trend and fading in its central and trailing portions, but there is now some minor development in the ambit of the main leading spot. Elsewhere on the facing side, previous strong growth in some active regions has now ceased in the south centre and northwest.

No new Earth-directed Coronal Mass Ejections (CMEs) have been confirmed - a jet-like emission from the largest sunspot region at 23/1700UTC was linked with a faint, apparently mainly southwest-heading CME iin imagery, however this feature passes below and ahead of the Sun-Earth line to no anticipated effect. At the very end of the 24 hours, a long-period (and ongoing) Common class flare and probable CME was released from behind the oncoming eastern solar horizon, again hinting at a possible arriving sunspot region here over the UTC weekend. No Earth effects are expected given the emission longitude.

Solar Wind / Geomagnetic Activity: Earth appears to be under the residual influence of the 'coronal hole'-driven fast wind. The solar wind speed persisted at slightly elevated levels, while the number of particles comprising the wind and their associated magnetic field were both unremarkable.

The net result of the above solar wind measures was mainly quiet geomagnetic activity.

Energetic Particles / Solar Radiation: No solar radiation storms were observed, with a very weak 10MeV proton enhancement (peaking below 1pfu) in the previous 24-hour period now faded.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a daily chance of isolated Moderate-class flares, and a slight chance of Strong-class. The expected trend in risk is now slightly upwards.

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Solar Wind / Geomagnetic Activity: Up to two CMEs may affect Earth in the period: firstly a 21 January CME, perhaps narrowly glancing 25/0600UTC; and secondly a potentially fuller glance from the 22 January CME, due 25/1800UTC. No new coronal hole fast winds feature in the forecast.

Initially quiet conditions may give way to chance of a period of peak G2 Moderate geomagnetic activity on day two, Saturday 25 January, waning over the ensuing UTC weekend to once again leave quiet conditions into the final day of the period.

Energetic Particles / Solar Radiation: There remains a slight chance of enhancements exceeding the S1 Minor Radiation Storm threshold should any notable X-ray flares occur.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	40	30	1
Strong	G3	No	1	15	10	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	50	60	60	60
Very Active	R3-R5 (X Class)	No	5	5	5	5

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	15	15
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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